VALVE ELECTRONIC

CV 2362
TO
CV 2368

Specification Mintech./CV2362 - CV2368 Issue 2A, Dated September 1967 To be read in conjunction with K1001 ignoring clauses:- 5.2, 5.3, 5.8.	SECURITY	
	Specification Unclassified	Valve Unclassified

← Indicates a change

Type of Valve:- Magnetron Cathode:- Indirectly heated Envelope:- Metal glass Prototype:- M525	MARKING K1001/4 also Serial No ....

RATING			Note	BASE None
Heater Voltage	(V)	8.5		
Heater Current	(A)	9.0		
Frequency (Centres)				
CV2362	(MHz)	2758		**CONNECTIONS & DIMENSIONS**
CV2363	(MHz)	2773		
CV2364	(MHz)	2788		
CV2365	(MHz)	2803		See Pages 5 & 6
CV2366	(MHz)	2818		
CV2367	(MHz)	2833		
CV2368	(MHz)	2848		
Max. Mean Input Power	(kW)	4.5	A.C.	
Max. Permissible Mean Anode dissipation	(kW)	3.0	A.	**PACKAGING**
Max. Frequency				
Pulling for V.S.W.R. 1.5.1	(MHz)	7	D.	To the requirements of the R.R.E. Valve packaging specification
Max. rate of rise of pulse voltage	(kV/uS)	160		
TYPICAL OPERATING CONDITIONS				
Peak Anode Voltage	(kV)	36		
Peak Anode Current	(A)	70	A.B.C	
Field strength	(gauss)	1800		
Peak Power Output	(MW)	1.1		

NOTES

A. When in operation the anode must be cooled by a flow of water such that the outlet temperature does not exceed 90°C.

B. The heater volts should be applied for at least 3 minutes before H.T. volts are applied.

C. These operating conditions apply for a pulse length of 1.25 uSecs. with a repetition rate of 1000 P.P.S. and assume operation of the valve into a load of V.S.W.R. not exceeding 1.5:1.   Under these conditions the heater voltage should be reduced to 6.0 volts when the H.T. is applied.

D. The rate of rise of the pulse voltage is defined as the maximum value of $\frac{dv}{dt}$ measured beyond the point where the pulse voltage first reached 80% of the value of the magnetron pulse voltage.

TESTS
To be performed in addition to those applicable
in K1001

	Test Conditions			Tests		Limits		No. Tested	Notes
	Vh	Field (gauss)	Peak Ia			Min.	Max.		
a	8.5	0	0	Ih (A)		8.0	10.0	100%	1.2.
b	See note 3	1800±25	70	Va (kV)		34	38	100%	2.3.4.
c	ditto	ditto	ditto	Output Frequency (MHz)				100%	2.3.4.
				CV2362		2750	2765		
				CV2363		2765	2780		
				CV2364		2780	2795		
				CV2365		2795	2810		
				CV2366		2810	2825		
				CV2367		2825	2840		
				CV2368		2840	2855		
d	ditto	ditto	ditto	Efficiency (%)		40		100%	2.3.4.
e	ditto	ditto	ditto	Frequency Pulling (MHz)			7	100%	2.3.4.5.
f	ditto	ditto	ditto	Spectrum Width (MHz)			2.5	Q.A.	2.3.4. 5.6.
g	ditto	ditto	Input Peak Power 2.5MW (Min)	Stability (Missing Pulses)			0.5%	100%	2.3.4.5. 7.

NOTES

1. The valve shall be run for a period of not less than 3 minutes with Vh = 8.5V, 50 c.p.s. supply.

2. For these tests the magnetron shall be water-cooled with a minimum water flow of 1 litre/minute at a maximum input temperature of 60°C.

3. (a) The modulator used for this test shall be approved by R.R.E. (1.25uS - 1000 p.p.s..). The valve shall be run for a period of three minutes with Vh = 8.5V. before the H.T. is applied. When the H.T. voltage is increased, the heater voltage shall be simultaneously reduced progressively, as full test conditions are obtained, to 6.0V.

(b) The magnetic field specified is to be measured at the centre of the magnet gap. The variation within a cylinder $1\frac{1}{2}$" dia. $1\frac{1}{8}$" long situated centrally and coaxial with the poles shall not exceed 10% overall. The north pole of the magnet shall be adjacent to the cathode lead of the valve.

3. (c) The modulator will be accepted as having a suitable rate of rise of pulse voltage if it is demonstrated to the Approving Authority that it has the following instantaneous rate of rise of voltage characteristic. The instantaneous rate of rise of pulse voltage for this purpose is defined as $\frac{dv}{dt}$, and may be measured with a suitable short C.R. The pulse voltage for this purpose is represented by V, which is a function of time, and may be measured by means of a suitable capacity divider.

The modulator will be set up together with the instruments required for the stability test, so that it would deliver 2.5 $\pm$ 0.1 Megawatts peak power into an otherwise acceptable magnetron, but with the magnetron removed and replaced by a total capacity of 12 $\pm$ 1 pfs. (i.e. the sum of the capacities of the padding capacitor and devices, including the safety device, specially connected in for the demonstration). Simultaneous observations of $\frac{dv}{dt}$ and V shall be made over the range V = 34.0 (Max) -38.0 (Min) kV, and within this range $\frac{dv}{dt}$ must not deviate by more than 7% from the maximum value of $\frac{dv}{dt}$ found within this range. The safety device, (connected to the modulator output terminals), should operate at V = 40k V (Min) and should absorb most of the output power of the modulator. The observed value of dv/dt Max. shall exceed 160kV/uS.

(d) The Manufacturer at his discretion may use any other suitable modulator, which shall be approved by R.R.E. for all tests except the STABILITY TEST.

4. The tests shall be carried out with the valve feeding direct through an approved coupling section into waveguide of internal dimensions of 2.84" x 1.34" terminated in a load of V.S.W.R. of better than 1.1:1.

5. Matching adjusted to give a V.S.W.R. of 1.5:1 (Min) and phase varied through 180°.

6. The figure quoted is for testing with a pulse length of 1.25uSecs. (see note 3a) (If a 2 uSec. pulse were employed the maximum spectrum width would be 1.5 MHz.) The spectrum width is to be measured at $\frac{1}{4}$ power. The spectrum shall be contained within the specified limits for a period of at least 1 second.

7. This shall be the first test to be performed after a holding period of 168 hrs (Min). Stability shall be measured in terms of the number of output pulses missing, expressed as a percent of the number of input pulses applied during an interval of 60Secs. The missing pulses due to any cause are considered to be missing if the r.f. energy is less than 70% of the normal energy level within the frequency range 2730-2875 MHz.

With the anode current set to the specified value on matched load as in (b) the mismatch shall be introduced and the phase adjusted to give maximum anode current. A missing pulse count shall be made over a period of at least 60 seconds. The phase of the reflection shall then be varied through 360° (one half guide wavelength) and then set to the position showing the maximum missing pulse rate. If the value of phase is less than 45° different from the previous setting, and if the previous value of the missing pulse ratio was less than 0.2%, this will be regarded as evidence of satisfactory performance. This part of the test shall be completed within 10 minutes of switching on the H.T. after the specified holding period. If the above two conditions are not satisfied, then the following bracketing procedure shall be used.

The phase of the mismatch shall be set to the position showing maximum missing pulse ratio, and then the phase altered to two values, one on each side of the previous setting and differing from it by not more than 15°. The missing pulse ratio shall be measured over an interval of not less than one minute in each position. If either of the values of missing pulse ratio found exceeds the value previously obtained, a further measurement shall be made following the same procedure, but in a single position beyond that giving the greater reading. The process shall be repeated until a value of missing pulse ratio is found which is less by at least 0.1% than the highest figure found. This test must terminate within 20 minutes of switching on the H.T. after a holding period.

THIS VALVE IS TO FIT BETWEEN
MAGNETIC POLES 3·010 DIA AND
2·125 APART, LOCATED SYMMETRICALLY
WITH RESPECT TO DOWEL HOLES
IN THE MOUNTING FLANGE AND
2·500 FROM THE REFERENCE FACE.

2 HOLES TAPPED
$\frac{1}{4}$ B.S.F. BY
$\frac{1}{4}$ DEEP.

6·000 DIA
+·000 −·010

HOLE ·312
DIA. + ·003.

HOLES TO CLEAR 8 STUDS
·245 DIA EQUI-SPACED ON
5·500 P.C.D. AND WITHIN
·005 OF NOMINAL POSITION.

4·750
DIA.

VALVE LOCATED BY
DOWEL PINS ·307 DIA.
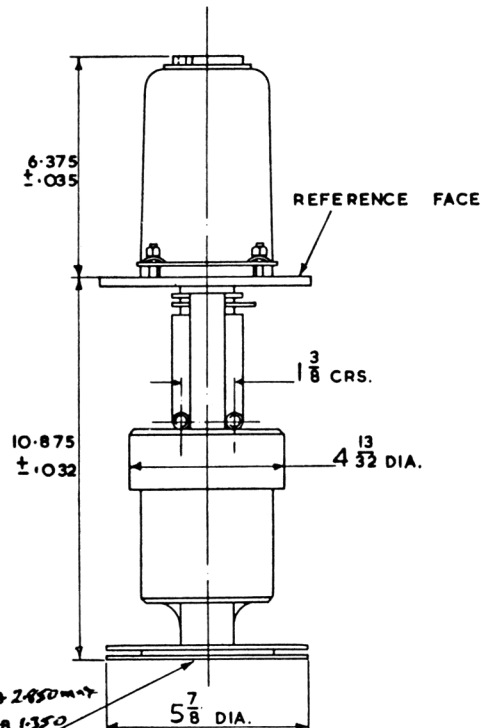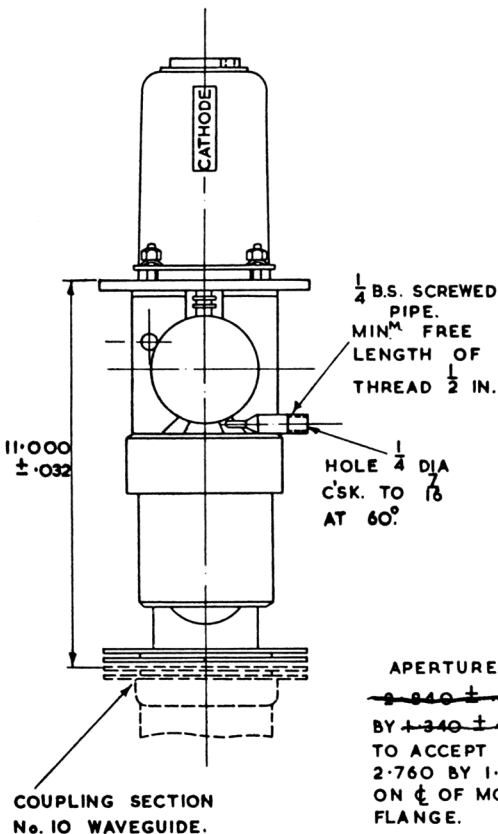AND ·245 DIA, SPACED
5·500 ± ·002 APART.

HOLE ·250
DIA. + ·003.

REFERENCE FACE
OF MOUNTING
FLANGE MUST BE
UNOBSTRUCTED
OUTSIDE THIS DIA.

CATHODE

$\frac{1}{4}$ B.S. SCREWED
PIPE.
MIN^M FREE
LENGTH OF
THREAD $\frac{1}{2}$ IN.

6·375
±·035

REFERENCE FACE

HOLE $\frac{1}{4}$ DIA
C'SK. TO $\frac{7}{16}$
AT 60°.

$1\frac{3}{8}$ CRS.

11·000
±·032

10·875
±·032

$4\frac{13}{32}$ DIA.

APERTURE :−

~~2·040 ± ·008~~ 2·050 m-t
BY ~~1·340 ± ·008~~ 1·350 m-t
TO ACCEPT PLUG
2·760 BY 1·260
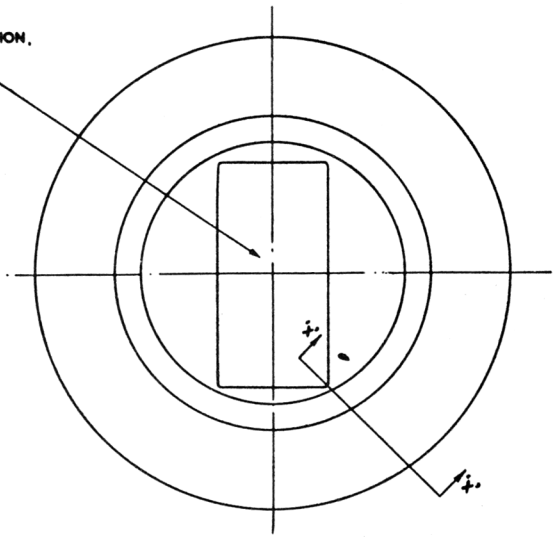ON ₵ OF MOUNTING
FLANGE.

$5\frac{7}{8}$ DIA.

COUPLING SECTION
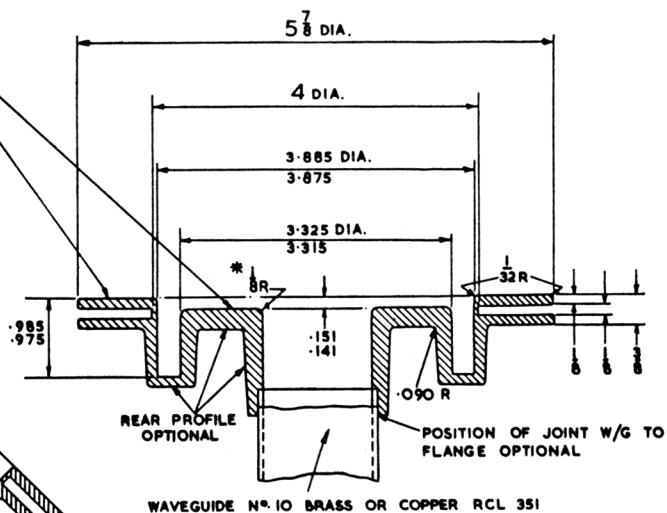No. 10 WAVEGUIDE.

THIRD. ANGLE PROJECTION.
DIMENSIONS IN INCHES.

BORE AS INTERNAL DIMENSIONS OF
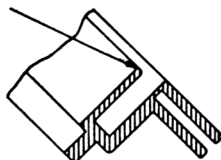W/G Nº 10 (RCL 351) NOT TO VARY BY
MORE THAN ·003 FROM NOMINAL POSITION.

NOTE :- ON ALL FOUR SIDES ⅛ R TO
FAIR IN TO GIVE A SHARP CORNER AS
SHOWN IN SECTION 'XX' LENGTH OF
FAIRING NOT TO EXCEED ⅛.

FRONT 'PROFILE TO BE FREE FROM
BLOW HOLES, MACHINING MARKS AND
OTHER DEFECTS.
FLAT TOL. :- ·003 WIDE.
SQUARE TOL. :- ·005 WIDE.
DATUM :- BORE OF FLANGE.

$5\frac{7}{8}$ DIA.

4 DIA.

3·885 DIA.
3·875

3·325 DIA.
3·315

⅛R

·32R

·985
·975

·151
·141

·090 R

SHARP CORNER

REAR PROFILE
OPTIONAL

POSITION OF JOINT W/G TO
FLANGE OPTIONAL

SECTION 'XX'

WAVEGUIDE Nº 10 BRASS OR COPPER RCL 351

THIRD ANGLE PROJECTION
DIMENSIONS IN INCHES
FRACTIONAL DIMENSIONS $-\frac{+1}{64}$

ELECTRONIC VALVE SPECIFICATIONS.

SPECIFICATION Mintech./CV2362-CV2368, ISSUE 2A, DATED SEPTEMBER 1967.

AMENDMENT No.1

Page 5. Outline Drawing.

View in top right hand corner.

The flange diameter is shown as "6.000 Dia $^{+~.000}_{-~.000}$"

which should be amended to read "6.000 Dia $^{+~.000}_{-~.010}$".

March 1968   T.V.C. for R.R.E.

ELECTRONIC VALVE SPECIFICATIONS
SPECIFICATION MINTECH/CV2362 - CV2368,
ISSUE 2A, DATED SEPTEMBER 1969
AMENDMENT NO 2   *Actually 37'*

PAGE 1   Text, headed 'Aperture' (bottom centre of page)

    Delete the first two lines of the text "2.840 $\pm$ .008 by 1.340 $\pm$ .008" and insert "2.850 max by 1.350 max"

Actually Page 5!

                                      Ministry of Technology/RRE

August 1970